

Section 7-06 -- Moveable Concrete Barrier

7-06.1 Introduction

A Moveable Concrete Barrier (MCB) is similar in appearance to common safety-shaped concrete barrier. A typical MCB can be transferred laterally from 4 feet to 18 feet in one continuous operation and at speeds of about 5 mph. It has the ability to reconfigure a road quickly, and to safely offer numerous solutions to the difficult construction staging and traffic handling problems. An MCB system can be operated indefinitely within an improved freeway median to provide a reversible traffic lane which can accommodate peak hour flows where additional highway widening is prohibitive and the directional traffic split is significant (i.e. 60-40 or greater). See [Section 7-06.3](#) for a list of applications for which a MCB could be used.

7-06.2 Warrants

The following guidelines are to be used to establish the warrants for using a MCB system to achieve an efficient and effective Traffic Management Plan (TMP). A MCB system may provide additional traffic capacity lanes for accommodation of both AM and PM peak traffic, a safe and expeditious means of expanding the Contractor's work area, and/or the opportunity to stage projects in a more efficient method.

A MCB system should be a type that can be quickly moved laterally from 4 feet to 18 feet in one continuous operation and at speeds of about 5 mph. The decision to use a MCB system should be made by the designer with capacity, safety and economics as the guidelines, and should include the following considerations:

1. Additional lanes can be utilized during peak hour traffic periods.
2. Additional working area can be gained during off peak hours that can reduce construction time and increase safety by reducing accidents and shielding highway workers.

3. Construction time can be shortened either through staging or increased productivity by the contractor.
4. Timing required to set up staging can be kept to a minimum.
5. Construction sites with limited work zones in urban or restricted areas where frequent day or nighttime lane closures will be required.
6. This system will provide a continuous, positive separation that will increase the degree of safety for motorists and highway workers.

Input for justification should be obtained from a Headquarters Traffic Operations Liaison.

7-06.3 Applications

A MCB system may be considered as a design alternative to traditional highway widening along highly congested urban corridors. The most common improvement strategy would utilize a MCB system to create a reversible traffic lane in a freeway median in order to accommodate peak hour traffic flows (with significant directional split). Since the MCB system requires higher operating and maintenance costs, it should only be considered where the cost and/or impacts of the traditional freeway widening alternative is prohibitive.

When developing a TMP, the use of these MCB systems should be limited to projects where a greater benefit can be attained than if standard methods and equipment were used. Listed below are types of projects where it would be a viable option for use.

1. Widening or reconstruction projects on highways, freeways or expressways with high peak hour traffic volumes (i.e. 50,000 AADT and greater for 4 lane facilities and 90,000 AADT and greater for 6 lane facilities).
2. Projects where a reversible traffic lane would be beneficial during peak traffic durations when significant directional traffic patterns exist. This would allow for better staging.

3. Median and shoulder reconstruction projects. Examples include shoulder/median improvements or widening, such as a new permanent concrete barrier being installed. The MCB is especially beneficial when the size of the work zone is either very restricted or if repeated lane closures are anticipated.
4. Resurfacing projects. By closing one side of a divided highway and creating opposing traffic lanes on the open side of the road, a contractor can resurface one side of the roadway at night without interference from traffic.
5. Reconstruction of parallel structures: Design of a reversible lane to increase the capacity of one structure while closing down the other.
6. Alternate routes do not have excess capacity for suitable detour.
7. Alternate routes do not exist.

7-06.4 Safety and Cost Considerations

In construction projects, a MCB system is generally used to open traffic lanes during peak traffic periods and close the lanes during off peak periods to allow improved access to the work zone. In this application, the MCB system has the unique ability to provide continuous positive protection before, during and after the opening and closing of traffic lanes. Once these barriers are on the road, it takes significantly less time to perform a lane closure with this barrier than it does using traditional methods. A determination should be made by the designer that this feature and resulting increased worker safety makes the use of a MCB system a viable alternative to conventional traffic control devices. Its use should be clearly described in the TMP.

When considering this product the designer should also prepare a cost comparison of the MCB and the next best alternative. The following items should be considered:

1. Cost of the MCB. The designer should work with the supplier to determine operational costs and a lease price to contractors.
2. The next best alternative and its cost.
3. If possible, the accident cost savings associated with the use of the MCB and the

next best alternative. It is assumed that there is no difference in accident costs when MCB is compared to precast concrete curb construction barrier of other types.

4. The savings in time for the project schedule should also be considered with the overall savings.

When using a MCB system, a buffer zone of 2 feet is desirable to allow for the deflection of the MCB system upon impact.

Use of a MCB system on land service roads should take into consideration access to properties and business. Access must be maintained during construction.

When using a MCB system, consideration for additional wide load signing in the TMP may be appropriate. If the barrier is used to reverse traffic flow and there is a single lane in one direction, it shall not be less than 10 feet

When using a MCB system on an unrestrained bridge shoulder, the distance between the edge of the bridge and the face of the MCB should not be less than 4 feet. If the distance between the edge of the unrestrained bridge shoulder and the face of the MCB is less than 4 feet, then the installation of angle connecting the bridge to the MCB system must be made in order to increase the stiffness of the MCB system.

A MCB system should be used on tangent sections and curves where an angle of impact of not more than seven degrees exists and where an allowable movement of the barrier of no more than 20 inches is acceptable when struck by a vehicle. The MCB system can be used on sharp curves where an allowable movement of the barrier of no more than 40 inches is acceptable when struck by a vehicle.

Approved safety end treatments such as inertial barriers (sand barrels) must be used in conjunction with the MCB to shield the approach ends of the barrier.